

RHIC BPM Meeting

May 22, 2008

Minutes

Attendees: Craig Dawson, Angelika Drees, Justin Gullotta, Rob Michnoff, Michiko Minty, Bob Olsen, Tom Russo, Todd Satogata

1. Purpose of this Weekly Meeting

- To share knowledge, ideas and desired improvements in order to provide an operationally robust BPM system.
- To keep us on track as far as schedule and specific work activities

2. Work List

All items on the list can be broken down into the following 4 categories:

- Fixed trigger pushbutton timing
- Operational stability and reliability
- Identification and handling of bad or suspect bad data
- System enhancements and new features (Todd)

3. Schedule

Perform integrated dry run test to exercise improvements – maybe October/November

4. Specific topics to be reported at next few meetings

Some possibilities include:

- Temperature drift test results and possible solutions
- Methods for identifying and handling bad data
- Calibration drift over time, differences between internal and external, and plan for calibrating prior to run, and periodic recalibration
- Specific integrated tests to be performed without beam.
- Physical position errors
- Continuous average orbit test results
- Desires for IR BPMs (Angelika)
- Maintaining Building/Alcove temperatures (Tom Russo)

5. Other Issues

Comments and discussions during the meeting included:

Tom stated that maintaining a high inventory of working BPM module spares is essential. Everyone agrees.

Michiko asked if we manage a list of BAD BPMs. Todd explained that we do not have an official list, but users typically enter comments into the BPM elog when BPMs deliver suspect data. Phil Cerniglia maintains the list of hardware and feedthrough failures reported by Todd and others through the run; this is the official list for repair during maintenance days and shutdown. Todd suggested that we document operational procedures for diagnosing BPM failures and resets.

Tom asked if BPM data were reviewed for feedthroughs that were not tagged as BAD with beam, but found as BAD with TDR testing. Justin and Todd had reviewed some BPM profile data and found no conclusive evidence that feedthroughs with BAD TDRs produced BAD measurements. Since TDR tests show reflections while timing profile scans look clean, all BPMs should be TDR'd once/year as preventative maintenance.

Tom reported that 30-40 replacement feedthroughs will be ordered.

Tom reported that he will research options for better building temperature stabilization, including service buildings and alcoves.

Tom stated that the newer feedthroughs are more reliable, and requested a list of BPM planes that require the highest reliability. The newer feedthroughs will be installed in the high reliability areas. Todd agreed to provide this list. There is a little concern that the new feedthroughs have to be tested before we put them into all the critical areas, in case there are unforeseen failure modes

Michiko stated that as part of the system temperature analysis we should identify all contributions including analog signal path components, timing components, filters, etc. Tom mentioned that the attenuators should also be included in the analysis. Referencing Kay Wittenberg at DESY, Tom recommended that we consider thermally coupling and anchoring the attenuators. Tom also stated that since we plan to provide better building temperature stabilization, a complete temperature analysis is not required. Todd agreed to some level. Rob feels that understanding the specific effects due to temperature variation is important. A thorough understanding may lead to devising additional solutions to providing accurate measurements. For example, we may find that periodic recalibration of the very fine delay generators with beam helps improve inaccuracies due to small temperature variations. Craig reported that based on studies a couple of years ago, the timing delays are highly sensitive. We agree to try to better understand the requirement for temperature control.

The dedicated oscilloscope for monitoring DX BPM signals was omitted from the work list. Craig stated that we plan to purchase 2 100 MHz scopes. We discussed that multiplexers may also be desirable to remotely select specific signals of interest.

Concerning the possible effect of wakefields in the DX BPMs, Justin pointed out that the BPM module has a 20 MHz filter at its input.

Michiko also stated that we must seriously consider a method for calibrating the BPMs without disconnecting cables and connecting an external signal. Everyone agrees, but a clear solution is not evident. To determine feasibility, calibration tests (without beam) should be performed using BPMs in a service building and/or alcove. External and internal calibrations can be performed and studied over a period of days or weeks. Internal calibrations can be performed days or weeks after the initial external calibration to determine reliability over time and varying temperature conditions.

Rob requests that documentation of test results be prepared to include the following typical sections: purpose of test, test setup, procedure, data results, conclusions, future tests.

Rob will work on drafting a schedule.